

# **DYNAMIC EXERCISE APPARATUS AND METHOD**

## **1. TECHNICAL FIELD**

The present invention relates generally to isometric and isotonic exercise devices and methods. More particularly, the invention includes a manually operable resistance apparatus in the form of rubber continuous loop band and method of using said apparatus in order to exercise at least six major muscle groups.

## **2. BACKGROUND OF THE INVENTION**

Isometric and isotonic fitness apparatus and methods of using such apparatus have been extensively developed for their ability to improve the muscular fitness level of the user by opposing the user's muscles to a resistant device. Physical exercise methods, to coincide with such manually operable apparatus, generally require the use of more than one appropriate device in order to exercise the six main groups of human muscles. Common fitness apparatus are composed of more than one device used in combination rendering the apparatus non-portable due to their size and weight. As an example, multiple apparatus work stations require extensive space and storage facilities for such bulky devices.

Considerable effort has been devoted to the development of novel fitness apparatus and methods of use for exercising main groups of large and small muscles without the need for multiple bulky apparatus prone to breakage and repair. Accordingly, single manually operable exercise apparatus have been established including resistance exercise apparatus. Some exercise apparatus, such as Dyna-Band<sup>®</sup> and Dura-Band<sup>®</sup>, are thin sheets or strips of elastic material which may be held and stretched to provide resistance for muscle flexion. The Dyna-Band<sup>®</sup> and Dura-Band<sup>®</sup> strips are synthetic and prone to breakage. They are available only in very minimal thicknesses and therefore do not provide adequate resistance for users with well developed levels of muscular fitness. The strips are not effective when tied in a loop as

a structural flaw is created which will break at a low level of tension. The strips are therefore ineffective for exercising most muscle groups.

Conventional resistance exercise bands are generally composed of non-rubber materials such as thermoplastic elastomer. An example of a synthetic exercise band is U.S. Patent No. 5,945,060 ("'060"). The '060 patent describes two methods of manufacturing thermoplastic elastomer exercise bands. The bands are extruded through a die and a gas may be introduced into the extrusion to expand the material before cutting. The bands disclosed have a thickness between 0.1 mm and 1.25 mm and have an elasticity of between 300 and 900 per cent. Disadvantages of the '060 patent include a low resistance due to the thinness, a short life-span due to low tensile strength, and uneven elasticity which is not suited to muscle training. These disadvantages are inherent in synthetic exercise bands. As the thickness of the band disclosed in the '060 patent increases, the elasticity decreases. Additionally, as a synthetic band is stretched, the resistance increases over the course of the movement. The present invention maintains constant 600% elasticity regardless of thickness.

U.S. Patent No. 5,860,896 ("'896") discloses a posture-aiding device composed of a polyester, nylon and latex rubber mixture and formed into a continuous loop or band. The user passes her arms through the loop and positions the loop horizontally across her back. The '896 patent teaches a posture improvement through the passive resistance of the loop. The '896 patent does not teach exercises to improve muscle strength, and discloses only one position in which the loop may be employed. The '896 patent discloses only one thickness and length for the loop, thereby limiting the ability of the device to improve muscle strength.

Typically exercise devices employing natural gum rubber are composed of several parts, making manufacture and use of the band complex. An example is U.S. Patent 3,677,543 ("'543"). The '543 patent discloses a single length of rubber surgical tubing with loops formed at each end, S-shaped hooks that receive the folded ends of the tubing, a ring for anchoring the device, and sleeves over the looped portion of the device. Disadvantages of the '543 patent and other multi-component exercise devices incorporating a rubber band include the difficulty to assemble the device, lack of portability, requirement that the device be attached, and limited range of muscles that may be exercised using the device.

Bally Fitness discloses synthetic aerobic bands on the Internet at "www.ballyfitness.com". The bands are relatively short, having lengths between 8 and 12 inches, and widths of 3/8, 3/4 and 1 inch. The Bally bands are low resistance and are appropriate for a narrow range of exercises requiring minimal strength, for instance for people suffering from arthritis. The Bally bands are for specific applications, having a very limited number of exercises which can be performed due to the short length of the band and the low resistance, and are not suitable for attachment to objects other than the human body. Due to the small, narrow dimensions of the Bally bands, they will not seat well on human limbs, and are too short to be placed about the human torso. The Bally bands are for low intensity aerobic exercises. The present invention applies to anaerobic muscle strengthening exercises for a wide range of muscle groups and strengths.

The method of use is as important as the apparatus structure and function. If used incorrectly exercise bands can cause serious injuries to the user. Before each use, particularly with synthetic exercise devices, careful examination of the device must be performed to ensure that there are no nicks, small tears, or punctures commonly found amongst resistance exercise device. These pre or post manufacture faults may cause the device to break resulting in injury to the user from the recoiling device released under tension. Also, the correct method of use must be employed. Hence, of equal importance, in relation to the structure and function of the appropriate exercise resistance device, are the physical exercise movements of human muscles including the six main muscle groups of the chest, back, shoulders, arms, legs and abdominal.

In light of the above mentioned disadvantages with the prior art exercise devices and methods, it is the object of this invention to disclose an isometric and isotonic exercise apparatus and method which is portable, lightweight, requires little or no set-up time, is capable of working all six major muscle groups of the human body, is durable, has constant elasticity of approximately 600%, seats well on the human body, and can be employed in different embodiments to provide a resistance appropriate to the varying muscular fitness of different individuals for anaerobic exercising.

### 3. SUMMARY OF THE INVENTION

This invention is discloses a unique manually operable natural gum rubber resistance exercise band which can provide, with specific best fit methods of use, a safe and efficient, cost effective way of enhancing the strength of major or minor muscle groups, including the main six muscle groups, without the need for multiple materials or devices of heavy or over sized exercise apparatus.

An exercise apparatus for the human body comprising an elastic apparatus or band formed in a closed or continuous loop is provided. The manually operable resistance apparatus may also comprise one or more sides of said apparatus having gloss or matt finished textures. Preferably both sides have a smooth, gloss surface.

In one embodiment of the invention, solid rubber can be selected from natural or synthetic gum rubbers or combinations thereof, preferably from pre-set industrial gum rubber for example, red Dura Shield AB-140 or black Dura Shield AB-160 gum rubber. More preferably the gum rubber is light in weight, of durable strength and has efficient recoiling memory.

The band width is of a wide, flat and strengthened stable platform suitable to give full support during the method of use. A pre-determined band width of the said apparatus can be from about 10 mm to about 150 mm. Preferably, said band width is from about 20 mm to about 100 mm.

The band thickness is of a dimension suitable to give effective resistance capacity or elasticity during the method of use. A pre-determined band thickness of the apparatus is preferably between 1 mm to about 16 mm. Optimally, the band thickness between 2 mm and 10 mm.

The band length is of a variable dimension suitable to give effective resistance or elasticity capacity during the method of use for users of different sizes. A band length of the apparatus may be between 1000 mm and 3000 mm. The band ends can be fixed together with a suitable fixing adhesive, for example, Cyanoacrylate, forming a closed loop band of required length. Preferably, said band length is from 500 mm to about 1500 mm in a fixed or sealed closed looped band. More preferably, the resistance capacity of the active band length can be six times its original length when stretched.

A method of exercising the human body with an elastic band formed in a continuous loop is disclosed comprising the steps of:

- (a) positioning said elastic band on at least two points of contact;
- (b) a user applying tension to said elastic band between said points of contact and;
- (c) said user gradually releasing tension from said elastic band between said points of contact such that said elastic band returns back to its original length;

Steps (b) and (c) are repeated in sets to provide exercise to the user. Preferably, positioning of the apparatus of step (a) will coincide with flexion and extension movements of muscle groups to be exercised. More preferably, a plurality of apparatus lengths and thickness may be used individually or combined. The preferred choice of contact of the apparatus may be the gloss finished texture of the apparatus against the user's body and the matt finished texture against the point of contact. More preferably, the point of contact may be a stationary object.

The method may optionally comprise inverting the apparatus showing a glossed texture contacting the body and a matt texture at the point of contact of a stationary or immovable object. A preferred choice of immovable object may be, for example, a hinged door, laden chair or a step. The method of contacting the apparatus at the point of contact may further comprise an additional fastening device from in between the apparatus to an immovable object.

More preferably, the method of the present invention uses points of contact on the body including, but not limited to, one or more hands, hands and feet, torso and hands, torso and one or more feet, a stationary object and one or more hands, a stationary object and one or more feet.

The apparatus is stretched between the points of contact on the user and optionally also on a stationary object. The user must exert muscular force to stretch the apparatus, thereby increasing his or her fitness level. Apparatus of increasing thicknesses may be employed by the user to incrementally increase the resistance of the apparatus and therefore the strength required to use the apparatus. In this manner the user may gradually improve his or her fitness level.

#### 4. BRIEF DESCRIPTION OF THE DRAWINGS

The method and apparatus of the present invention will now be described with reference to the accompanying drawing figures, in which:

FIG. 1 is a perspective view of an embodiment of the present invention.

FIG. 1A is a perspective view of an embodiment of the present invention, formed with open hand loops at each end.

FIG. 2A is a perspective view of an embodiment of the present invention, showing the invention in use by a man with the device held in both hands in an at rest position for the Anterior Deltoid Raise exercise.

FIG. 2B is a perspective view of an embodiment of the present invention, showing the invention in use by a man with the device held in both hands in an extended position for the Anterior Deltoid Raise exercise.

FIG. 3A is a perspective view of an embodiment of the present invention, showing the invention in use by a man with the device held in both hands and placed under both feet in an at rest position for the Standing Bicep Curl exercise.

FIG. 3B is a perspective view of an embodiment of the present invention, showing the invention in use by a man with the device held in both hands and placed under both feet in an extended position for the Standing Bicep Curl exercise.

FIG. 4A is a perspective view of an embodiment of the present invention, showing the invention in use by a man with the device held in both hands and placed against his torso in an at rest position for the Middle Pectoral Press exercise.

FIG. 4B is a perspective view of an embodiment of the present invention, showing the invention in use by a man with the device held in both hands and placed against his torso in an extended position for the Middle Pectoral Press exercise.

FIG. 5A is a perspective view of an embodiment of the present invention, showing the invention in use by a man with the device placed against his torso and under one foot in an at rest position for the Quadriceps Lunge exercise.

FIG. 5B is a perspective view of an embodiment of the present invention, showing the invention in use by a man with the device placed against his torso and under one foot in an extended position for the Quadriceps Lunge exercise.

FIG. 6A is a perspective view of an embodiment of the present invention, showing the invention in use by a man with the device held in both hands and placed about a door in an at rest position for the Standing Triceps Pressdown exercise.

FIG. 6B is a perspective view of an embodiment of the present invention, showing the invention in use by a man with the device held in both hands and placed about a door in an extended position for the Triceps Pressdown exercise.

FIG. 7A is a perspective view of an embodiment of the present invention, showing the invention in use by a man with the device wrapped around both feet and placed about a door in an at rest position for the Lower Abdominal Raise exercise.

FIG. 7B is a perspective view of an embodiment of the present invention, showing the invention in use by a man with the device wrapped around both feet and placed about a door in an extended position for the Lower Abdominal Raise exercise.

## 5. DETAILED DESCRIPTION OF THE INVENTION

Referring to Figure 1, the preferred embodiment of the present invention is shown in perspective. The exercise band 10 is a continuous loop of elastic material. The band 10 may be comprised of natural or synthetic gum rubber or a combination thereof. Preferably the band 10 is comprised of industrial gum rubber for example, Dura Shield AB -140 or Dura Shield AB -160 natural red gum rubber. Relative to synthetic alternatives, gum rubber is light in weight, durable and has an efficient recoiling memory. Structure of the apparatus is pre-determined and manufactured to the required specifications. The apparatus length and thickness can be fixed in proportion to the desired resistance capacity. In the preferred embodiment, the band 10 has an inner surface 12 and an outer surface 14, both having a gloss or smooth texture which provides optimal grip against body or object surfaces, and also optimal comfort for the user. Optionally, the band 10 may comprise a matte or roughly textured inner surface 12 and a smoothly or gloss textured outer surface 14.

The band 10 is sufficiently wide to sit on the human body without rolling, moving laterally or slipping during stretching of the band 10. Preferably, the width of the band 10 is between 10 mm and 150 mm. Optimally, the width of the band 10 is between approximately 25 mm and 100 mm.

The thickness of the band **10** is of a dimension suitable to give effective resistance capacity or elasticity during the method of use. A pre-determined thickness of the band **10** can be between approximately 1 mm and 16 mm. Preferably, the thickness of the band **10** is between approximately 2 mm and 12 mm. In the preferred embodiment, a plurality of bands **10** are provided of increasing thicknesses such that as the user's muscular strength increases, bands **10** having a greater thickness therefore greater resistance to stretching may be employed to continually increase the muscular strength of the user.

The length of the band **10** is of a variable dimension suitable to give effective resistance or elastic capacity during use for users having different body sizes. The circumferential length of the band **10** is preferably between approximately 500 mm and 3000 mm. Typically, the band **10** is formed from an extrusion of natural gum rubber (not shown) provided by the manufacturer in a range of thicknesses. Strips (not shown) may be cut from the extrusion to the desired width. The two ends of the strips may then be fixed together with a suitable fixing adhesive, for example, Cyanoacrylate, forming a closed loop band **10** of a chosen length with a seam **16**. Preferably, the open ends of the strip, prior to fixing, may be diagonally at approximately a 90-degree angle from the edge of the band **10**. The two open ends of the strip are then overlapped and sealed with any common, commercially available adhesive suitable for natural gum rubber. The width of the overlapped portion of the strip need not be large, and may be between an infinitesimal overlap and approximately 30 mm. Alternatively, the open ends of the strip of the strip may be diagonally sliced angle at an less than 45 degrees from the edge of the strip, thereby increasing the surface area of the first open end of the strip available for contact with the other end and for gluing, making a more controlled fixed seam. Alternatively, a butt jointed seam **16** may be created by gluing the ends of the strip directly to each other such that there is no overlap and a smoother seam is achieved.

The outer surface **14** of the band **10** may be textured with a cross-hatched, ribbed or other raised or relief pattern such that the band **10** grips firmly either to the human body, clothing or fixed objects such as doors with lateral movement or rolling, even when, for instance, the user is perspiring which can lead to slippage of the band **10**.

The inner surface of the band 10 can be smooth to facilitate a comfortable grip with the hands of the user without abrading or chaffing the user's hands.

The natural gum rubber band 10 can be stretched to approximately six times its original length and has a recoil memory and durable strength sufficient to retain the resistance capacity after prolonged usage.

Another aspect of the invention provides a method of using the exercise band 10 as a resistance apparatus to human muscles to increase strength of the particular muscles. The natural rubber band 10 can be used to target specific muscles and muscle groups of the user to increase muscular strength in the desired area or areas. Combined with using bands 10 of increasing thickness to gradually increase the resistance capacity of the exercise band 10 as the strength of the particular user increases, the method provides for a long term, low impact exercising for muscular fitness which avoids injury.

The exercise method involves placing the band 10 on or around the user's body and at least one other contact point, either on the user's body or a fixed object such as a door. No attachment means are required, other than the band 10 itself. The user then flexes the muscle or muscle group desired to be exercised against the resistance of the band 10, thereby lengthening the band 10. Once the particular muscle is fully or partially flexed, to the comfort of the user, the muscle is then gradually relaxed back to the neutral position of the body thereby returning the band 10 to its original length. Repetitions of the same exercise are recommended. The user may wish to pause at the point when the muscle is fully extended, as the resistance of the band 10 against the muscle being exercised provides the benefit of continual exertion and exercise for the user.

A plurality of band 10 lengths may be used individually or combined. The band 10 can be used in the form of an open loop around the user's body, or folded or layered together such that the inner surface 12 of the band 10 is largely contiguous. The user may place the smooth inner surface 12 of the band 10 against their body, or the matte outer surface 14, as is desired. The matter surface 14 provide greater friction therefore is useful against points of contact to reduce or eliminate slippage. The smooth surface 12 prevents chaffing when placed against the user's hands, for instance.

As a further means for safe usage of the apparatus, the method may optionally comprise attaching or placing the inner surface **12** of the band **10** on the user's body and attaching or placing the matte outer surface **14** on a stationary or immovable object, thereby, restricting movement of the apparatus on the stationary or immovable object. A preferred choice of immovable object may be, for example, a hinged and framed open or closed door, desk, or an object raised above ground level. The method of placing the apparatus on or about a stationary object may further comprise an additional fastening device, for example, a retaining device secured to an immovable object, for example, a wall bracket retainer, secured to a wall.

It will be seen that the method of the present invention uses points of contact on the body including, but not limited to, one or both hands, hands and feet, torso and hands, torso and one or both feet, a stationary object and one or both hands, a stationary object and one or both feet.

The exercise method provides exercises for the six muscle groups of the human body. An advantage of the present method is that a wide range of muscles in the human body can be exercised using the apparatus. For ease of reference, each muscle group is denoted with one or more of the following abbreviations: (c) for chest muscle groups; (b) for back muscle groups; (s) for shoulder muscle groups; (r) for muscle groups of the arms; (l) for leg muscle groups and (a) for the abdominal muscle groups. The muscle group abbreviation shall follow the name of the exercise in the following description. The user may be referred to as "he", and is intended to include both genders.

Prior to the initiation of the exercise movement, tension adjustments may be made by shortening or lengthening the active length of the apparatus depending on the size and strength of the individual user. The active length is the distance between any two contact points on the band **10**, for instance, the two hands of the user. The user simply grasps the band **10** at substantially opposite ends of the band **10** to create a relatively low resistance. To increase the resistance, the user grasps the band **10** at two points which are closer, thereby requiring more force to stretch the band **10**. Another method of increasing the resistance is to fold the band together so that the inner surface **12** is contiguous, creating a closed loop. An open loop will provide less resistance to

the user. The band 10 is of course a continuous loop, but may be employed in an open or closed position.

Figure 2A depicts a man with the apparatus held in both hands in an at rest position for the Anterior Deltoid Raise exercise. This exercise affects the shoulder muscle group. In the at rest position, the user stands in a neutral position with a first hand against his hip. The apparatus is placed with the inner surface 12 against the palm of the user's hands. The user's second hand is placed in front of the first hand and abutting it, with straight arms. The second hand is extended in a smooth motion away from the user's body in a forward and upward motion without bending the elbow, such that the users muscles are contracting against the resistance of the band 10.

Figure 2B depicts a man with the band 10 held in both hands in an active position for the Anterior Deltoid Raise exercise. The user's second hand is fully extended and held in front of the user's shoulder and slightly above it, and the user's shoulder muscles are contracted or flexed in opposition to the tension of the band 10 thereby providing exercise for the shoulder muscle group. From this position, the user lowers his second hand in a smooth, straight arm motion such that the second hand again abuts the first hand still firmly placed against the user's hip. By changing the hand position on the one hip for the opposite hip alternative arm action of a forward movement is achieved. The exercise should be repeated a number of times which is challenging to the user and may be tailored to the individual by consulting a relevant professional such as a personal trainer or fitness expert.

Other exercises performed when using the band 10 held in both hands include the Medial Deltoid Raise, the Posterior Deltoid Raise, Rotator Cuff Pulls, Front Latissimus Dorsi ("Lat.") Pull, and Rear Lat. Pull.

The Medial Deltoid Raise (s) performed in the same manner as the Anterior Deltoid Raise, with the exception the users second hand is extended outwards to the side of the body.

The Posterior Deltoid Raise (s) is initiated from either a standing or sitting position. The user's arms are extended forward at shoulder level, palms facing downward with the elbows slightly bent. A lateral pulling motion of both arms outwards towards the sides of the user's body is continued until full flexion movement cannot be continued.

The Rotator Cuff Pull (s) is initiated from a standing position with stationary elbows at the sides of the torso and hands extended forward from the elbows. With constant tension, one hand moves laterally as the other hand follows toward the mid-line of the body. The reverse motion is completed to exercise the opposite shoulder.

The Front Lat. Pull (b) is initiated from a sitting or standing position, with the user's arms extended straight upwards and overhead with the hands grasping opposite ends of the band 10. The user then stretches the band 10 in a downward lateral motion until maximum arm flexion is achieved. The elbows should remain slightly bent throughout the exercise, palms facing away from the body or pronated.

The Rear Lat. Pull (b) is initiated from a sitting or standing position, with the user's arms extended straight upwards and overhead, with the hands grasping opposite ends of the band 10. The band 10 is stretched tight such that the inner surface 12 is substantially contiguous with itself. The band 10 is held transversely to the medial line of the user's body and slightly behind the head. The user then stretches the band 10 in a downward lateral motion such that the band 10 passes behind the user's head to the posterior plane of the body until maximum arm flexion is achieved. The elbows should remain bent throughout the exercise, palms facing away from the body or pronated.

Figure 3A depicts a man with the band 10 held in both hands and placed under both feet in an at rest position for the Standing Bicep Curl (r) exercise. The user's hands are pronated or facing downwards and gripping the band 10, and the elbows are slightly bent. The Standing Bicep Curl is initiated from a standing position with apparatus contact between both the hands and both feet. The palms of the hands, shoulder width apart, are facing downwards or pronated. With elbows stationary at the sides of the torso the hands are moved upwards to full flexion with the hands supine, and back down to full extension. Figure 3B depicts the user with arms at full flexion.

Other exercises performed when using the band 10 held by one or both hands or feet using one or more varying lengths of apparatus include the Sitting Bicep Curl, the Reverse Curl, Hammer Curl, Isolation Curl, Wrist Curl, Upright Row, Shrugs, Outer Low Row, Inner Low Row, and the Quadricep Squat.

The Sitting Bicep Curl (r) is performed in the same manner as the Standing Bicep Curl, except that the user is seated in a chair, and may be leaning slightly

backwards. The palms of the hands may begin and finish the movement facing the body.

The Reverse Curl (r) is performed in the same manner as the Standing Bicep Curl, except that the palms of the hands are facing inward towards the body or pronated.

The Hammer Curl (r) is performed with the same motion as the Standing Bicep Curl, except the band **10** is looped under one foot and grasped with the hand on the same side, with the palm of the hand facing the mid-line of the body in the at rest position. The user then flexes his arm in the same manner as the Standing Bicep Curl.

The Isolation Curl (r) is initiated from a sitting position. For this exercise, the band **10** is folded such that the inner surface **12** is contiguous. The user places the non-extended band **10** under the heels of both feet, which are placed in a wide stance on the floor. A stationary elbow contacts the inner thigh. With one hand, palm supine, an upward motion continues until full flexion, then reversed for full extension. An alternate method for this exercise for this exercise is performed using the band **10** as an open loop with one foot placed in the loop and the heel of the foot pressing the band **10** to the floor.

The Wrist Curl (r) is initiated from a standing or sitting position with the band **10** grasped in both hands and held against the floor by the user's heels, in an open loop position. The elbows remain stationary at an approximately 90% angle as the hands, at shoulder width apart, curl upwards to full flexion. For the sitting position, the elbows rest on the thighs, wrists extend over the knees, the palms are facing upwards. The hand motion is upward to full flexion then downward to full extension or hyperextension, as desired.

The Upright Row (b) is initiated from a standing position with apparatus contact between the hands and feet, the palms of the hands are close together facing inwards toward the body, the arms are extended at the hip level. The user raises his arms upwards with the elbows leading the hands to achieve full flexion when the elbows are at or above ear level, then lowers his arms for full extension.

Shrugs (b) are initiated from a standing position. For this exercise, the band **10** is folded such that the inner surface **12** is contiguous, except for the two ends of the band **10** where loops are formed by placing the hands through the loop and grasping the

inner surface **12** such that two small sub-loops **18** are formed around the user's hands. The layered band **10** or closed loop is placed beneath both feet. With arms extended downwards, palms facing towards the mid-line of the body with limited elbow bend, the motion is an upward shoulder lift until full flexion is achieved. The reverse may be used for full extension. This exercise may also be performed with the feet placed in the two small sub-loops **18** and the hands grasping the mid-point of the layered band **10**.

The Outer Low Row (b) is initiated from a seated position with both legs extended. The closed loop band **10** is placed underneath the feet, hands hold the looped ends **18** of the band, and the palms are pronated. The user pulls the band **10** toward the torso until full flexion is reached. The reverse may be used for full extension.

The Inner Low Row (b) is performed in the same manner as the Outer Low Roll except that the looped ends **18** are positioned over each foot and the layered or closed loop band **10** is hand held, the palms are facing downwards.

The Quadricep Squat (l) is performed in the same manner as the Shrugs except that the user's arms remain motionless and the user squats to a seated position, then stands up and extends the legs in opposition to the resistance of the band **10**.

Figure 4A depicts the user with the band **10** in a closed loop position held in both hands at the ends of the band **10** and placed against the middle of his back in an at rest position for the Middle Pectoral Press (c) exercise. With palms supine in the looped ends **18** the user extends his arms forward until the arms are fully extended, as depicted in figure 4B. The reverse motion is completed for full extension.

Other exercises performed when using the band **10** is placed against the torso and held in one or both hands using one or more lengths of the band **10** in a closed loop position are the Lower Pectoral Press, the Upper Pectoral Press, the Pectoral Crossover, the Pectoral Fly, the Inner Pectoral Push-up, the Middle Pectoral Push-up, the Outer Pectoral Push-up, Dips, the Tricep Press, the Overhead Tricep Extension, and the Shoulder Press.

The Lower Pectoral Press (c) is performed in the same manner as the Middle Pectoral Press except that the closed loop band **10** is placed on the upper back and the user pushes his hands on an approximately 45 degree downward angle from the horizontal.

The Upper Pectoral Press (c) is performed in the same manner as the Middle Pectoral Press except that the closed loop band **10** is placed on the middle to lower back and the user pushes his hands on an approximately 45 degree upward angle from the horizontal.

The Pectoral Crossover (c) is performed in the same manner as the Middle Pectoral Press except that the hands are positioned widely at chest height. The arms, with limited elbow bend, move in a forward, inward lateral direction until the hands cross over each other and full flexion is complete.

The Pectoral Fly (c) is performed in the same manner as the Pectoral Crossover except that the hands do not cross over each other.

The Inner Pectoral Push-up (c) is performed in the same manner as the Middle Pectoral Press except that the initial position is prone, as for a traditional push-up. The hands are placed close together and below the chest.

The Middle Pectoral Push-up (c) is performed in the same manner as the Inner Pectoral Push-up except that the hands are placed shoulder width apart.

The Outer Pectoral Push-up (c) is performed in the same manner as the Inner Pectoral Push-up except that the hands are placed wider than shoulder width apart.

Dips (c) are performed in the same manner as the Lower Pectoral Press, except that the user lowers his arms with them adjacent to his body.

The Tricep Press (r) is performed in the same manner as the Middle Pectoral Press except that the arms begin from a chest level, in a forwardly extended position. The elbows remain stationary as the user's forearms are flexed towards the head or upper torso. The reverse is required for full extension.

The Overhead Tricep Extension (r) is initiated from a sitting position. The band **10** is placed under the lower torso or buttocks and held with one or both hands positioned high and behind the back of the neck. The motion of the hand or hands is upward above the head until full extension is complete. The reverse is required for full flexion.

The Shoulder Press (s) is initiated from a sitting position, with the open loop band **10** placed under the lower torso or buttocks and gripped in each hand, positioned at shoulder level, the palms are facing upwards or supine. The motion of the hands is upwards until full extension is complete. The reverse is required for full flexion.

Figure 5A depicts the band 10 in an open loop and placed against the user's torso and under one foot in an at rest position for the Quadricep Lunge exercise. The Quadricep Lunge (l) is initiated from a standing position with band 10 under the user's left foot and over the user's right shoulder or alternatively, under the user's right foot and over the left shoulder. The foot resting on the band 10 is positioned ahead of the opposite foot. The torso is lowered downward until the upper and lower leg are at an angle of approximately 90 degrees. For full extension, the leg must be straightened.

Figure 5B depicts the user with his leg in full flexion during the Quadricep Lunge.

Other exercises performed when using the band 10 is placed on the user's torso and one or both feet using one or more varying lengths of apparatus include Quadricep Squats, the Calf Raise.

The Quadricep Squat (l) is performed in the same manner as the Quadricep Lunge except the placement of the open loop band 10 is under both feet placed parallel on the floor.

The Calf raise (l) is performed in the same manner as the Quadricep Lunge except that one foot is placed on the edge of an object raised above ground level, for example, a stair step, whereby the raised level supports the user. The knee remains straight as the heel of the foot is raised until full dorsiflexion is complete. For full dorsiflexion the heel is lowered below the raised supporting object.

Figure 6A depicts the band 10 held in both hands and placed about a door in an at rest position for the Standing Triceps Pressdown (r) exercise. This exercise is initiated from a standing position directly in front of a fixed object, such as the top outer edge of an open door or a metal wall bracket. The exercises are described in relation to a door, but it should be understood that various fixed objects may be used, provided the band 10 can be placed on or about the object. The open loop of the band 10 is placed on the top edge of the door, and the user grasps the band 10 on each side of the door. The open loop band 10 is held in position against the object by friction. In this manner, the textured inner surface 12 of the band 10 is useful for increasing friction. The user holds his elbows stationary at his side. The user's hands are placed at shoulder height with palms facing toward the mid-line of the body. The user moves

his hands downward until full extension is complete. The exercise is completed by the user raising his arms until fully flexed.

Figure 6B depicts the user performing the Triceps Pressdown exercise with arms in the fully extended position.

Other exercises performed with the band 10 is attached to or placed about a stationary object and gripped in the user's hands include the Kneeling Tricep Press, the Kneeling Lat. Pull, the Kneeling Wide Lat. Pull, the Reclined Lat. Pullover, and the Reclined Pectoral Pullover.

The Kneeling Tricep Press (r) is performed in the same manner as the Triceps Pressdown except that the user kneels down and places his back against the edge of the door facing away from the door and the motion is at a downward 45 degree angle from the horizontal.

The Kneeling Lat. Pull (b) is performed in the same manner as the Triceps Pressdown except that the user kneels facing the edge of the door, and the closed loop band 10 placed on the top of the door. The user grips the looped ends 18 of the band 10. Overhead extended arms pull downward until full flexion is complete. The exercise is completed by extending the arms to the at rest position.

The Reclined Lat. Pullover (b) is initiated with the user lying supine with his arms extended overhead and behind. The open loop of the band 10 is placed under the lower edge of the door in a closed or open position, then grasped by the user with both hands. Alternatively the band 10 may be secured to metal bracket at a low level affixed to an immovable object. The user keeps his elbows bent at a constant angle, of approximately 40 degrees, and rotates his arms downward until the elbows contact the floor. The exercise is completed by extending the arms over the head.

The Reclining Pectoral Pullover (c) is performed in the same manner as the Reclined Lat. Pullover except that the user's arms remain relatively straight and the pulling motion ends above the chest.

Figure 7A depicts a man with the band 10 wrapped around both feet with the inner surface 12 contacting the top of the user's feet, and placed about the bottom edge of a door in an at rest position for the Lower Abdominal Raise (a) exercise. This exercise is initiated from a semi-reclined sitting position with the legs fully extended.

The user moves his legs upwards and inward toward the torso until full flexion is complete. The user then extends his legs to complete the exercise.

Figure 7B depicts the user with his legs fully flexed, in the active position of the Lower Abdominal Raise exercise.

Other exercises performed when using the band 10 placed on a stationary object and about one or both feet include the Upper Abdominal Curl, the Side Oblique Raise, the Back Extension, the Hamstring Curl, the Leg Extension, the Gluteal Extension, the Hamstring Extension, the Hip Raise, the Anterior Hip Extension, the Outer Thigh Push, and the Inner Thigh Pull.

The Upper Abdominal Curl (a) is performed in the same manner as the Lower Abdominal Raise except the end user moves closer to the secured door, elevates their legs to create apparatus tension, then curls upward their shoulders until full flexion is complete.

The Side Abdominal Raise (a) is performed in the same manner as the Lower Abdominal Raise except that the user lies on his side, lowers his knees, elevates his heels, then elevates his shoulder upward. If lying on the right side, the user places his right hand on his left hip and left hand at head level, and vice-versa to exercise the left side.

The Back Extension (b) is performed in the same manner as the Lower Abdominal Raise except that the user lies prone with the open loop band 10 on his rear heels, then elevates his heels creating, stretching the band 10. Simultaneously, the user places his hands in front of his torso, and hyperextends his back.

The Hamstring Curl (l) is performed in the same manner as the Back Extension except there is no extension of the back. The torso remains low to the floor and the legs begin in an extended position.

The Leg Extension (l) is initiated from a standing position. The user faces away from the door. The open loop band 10 is placed abutting the lower edge of the door. Bending from one knee, the user flexes his lower leg backwards and hooks the apparatus around his ankle. The user then extends his lower leg downward and forward. The distance between the door and the user's ankle in the at rest position can be used as a means of presetting the tension in the band 10 prior to the exercise. The exercise is completed by flexing the leg.

The Gluteal Extension (l) is performed in the same manner as the Leg Extension except that the user faces the door, hooks the apparatus with their lower heel, then extends their leg in a backward motion. The user's knee does not bend during this motion.

The Hamstring Extension (l) is performed in the same manner as the Gluteal Extension except that the user raises his knee to hip level then extends their leg in a downward and backward motion. The band 10 is positioned on the bottom of the selected foot.

The Hip Raise (l) is performed in the same manner as the Leg Extension except that the user lifts his leg in a forward and upward motion until the knee is level with the users hip.

The Anterior Hip Extension (l) is performed in the same manner as the Leg Extension except that the user initiates a low level forward, single leg motion, starting with both legs parallel with each other.

The Outer Thigh Abduction (l) is performed in the same manner as the Anterior Hip Extension except that the user positions his body sideways to the immovable object, in this case a firmly secured door, and hooks the open loop band 10 onto the side of one heel, limiting knee bending, then extends the leg outwardly in a lateral direction.

The Inner Thigh Adduction (l) is performed in the same manner as the Outer Thigh Abduction except that the user hooks the band 10 around the heel of a laterally extended leg. With limited knee bend, the lateral extended leg is pulled into the mid-line of the body or until both legs are in contact.

The preferred embodiments herein described are not intended to be exhaustive nor to limit the scope of the invention to the precise forms disclosed. They are chosen and described to best explain the principles of the invention and its application and practical use to allow others skilled in the art to comprehend its teachings.

As will be apparent to those skilled in the art in the light of the foregoing disclosure, many alterations and modifications are possible in the practice of this invention without departing from the spirit or scope thereof. Accordingly, the scope of the invention is to be construed in accordance with the substance defined by the following claims.